INSTALLATION RESTORATION PROGRAM

January 2002

Proposed Plan for Soil and Sediment Remedial Action at Site/SWMU 1 and SWMU 41

Marine Corps Recruit Depot
Parris Island, South Carolina

Introduction

This document presents the Proposed Plan for Site/Solid Waste Management Unit (SWMU) 1 and SWMU 41 at the Marine Corps Recruit Depot (MCRD) Parris Island, South Carolina. (For the remainder of this document, these sites/SWMUs will be referred to as Site 1 and SWMU 41.) Site 1 is a landfill that was formerly used for the disposal of combustible wastes and municipal trash. SWMU 41 was an incinerator unit that was used to incinerate waste that was disposed at Site 1. As a result of past waste disposal activity at Site 1 and SWMU 41, potential risks to human health and the environment exist through exposure to waste and contaminated soil, sediment, and surface water. This Proposed Plan summarizes results of investigations conducted to characterize the nature and extent of contamination at Site 1 and SWMU 41. Additionally, remedial alternatives considered for the cleanup of Site 1 and SWMU 41 are discussed, and the evaluation of these alternatives is summarized. Remedial alternatives considered for Site 1 and SWMU 41 include a no-action alternative (Alternative 1), two containment options (Alternatives 2a and 2b), and excavation of all contaminated site material and subsequent disposal at an approved disposal facility (Alternative 3).

This Proposed Plan was developed by the MCRD Parris Island Partnering Team, which includes representatives from the Department of the Navy (Navy), Marine Corps, United States Environmental Protection Agency (U.S. EPA), and South Carolina Department of Health and Environmental Control (SCDHEC).

This document was developed in accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and applicable provisions of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) [40 CFR 300.430(f)(2)]. This Plan highlights key information from the remedial

The Remedial Action Proposal

The preferred alternative presented in this Proposed Plan is a modified Alternative 2a. This remedial alternative consists of the following components:

- Excavation of waste outside the limits of a proposed landfill cap.
- Excavation of sediment containing concentrations of inorganic chemicals, polynuclear aromatic hydrocarbons (PAHs), and pesticides above clean-up goals for protection of ecological receptors.
- Consolidation of excavated material within a proposed cap system.
- Installation of a low-permeability cap system over the consolidated and regraded contaminated material.
- Installation of slope stabilization and erosion control measures.
- Restoration and monitoring of the salt marsh area where excavation was performed.
- Operation and maintenance (O&M) of the landfill cap system.
- Long-term monitoring of groundwater and sediment.
- Land-use controls and 5-year reviews of the site.

In accordance with CERCLA Section 117, this document summarizes the Proposed Plan for Site 1 and SWMU 41 at MCRD Parris Island. For more detailed information, please consult the Administrative Record File located in the information repository at the Beaufort County Public Library Headquarters (311 Scott Street, Beaufort, South Carolina 29902).

investigation/Resource Conservation and Recovery Act (RCRA) facility investigation (RI/RFI) and feasibility study/ corrective measures study (FS/CMS) performed for Site 1 and SWMU 41 but is not a substitute for the these reports. More detailed information is located at the information repository for Site 1 and SWMU 41 in the Administrative Record file. Following the issuance of this document, the public is invited to review the Administrative Record File and comment on the Proposed Plan. As the lead agency, the Navy is required to publish the Proposed Plan to fulfill the public participation requirements of CERCLA and the NCP. The Partnering Team, in consultation with the local community, will select a final remedy for Site 1 and SWMU 41 after all public comments have been addressed. Please note that the Navy, in consultation with the U.S. EPA and SCDHEC, may modify the Preferred Alternative of this Proposed Plan or select another response action based on any new information that may become available during the public comment period.

As the lead agency, the Navy is accepting formal public comments on the Proposed Plan from January 31, 2002 to April 2, 2002. You do not have to be a technical expert to comment. If you have a concern or preference, the Partnering Team wants to hear it before making a final decision. To comment formally, offer oral comments during the comment portion of the public meeting (see page 10 for details). Or send written comments, postmarked no later than April 2, 2002, to

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Facility Description

MCRD Parris Island, South Carolina (see Figure 1) is the reception and recruit training facility for the Marine Corps for enlisted men from states east of the Mississippi River and for enlisted women nationwide. The Depot is located along the southern coast of South Carolina, within Beaufort County, approximately 1 mile south of the city of Port Royal and 3 miles south of the city of Beaufort, and occupies an area of approximately 8,047 acres. MCRD Parris Island was added to the U.S. EPA's National Priorities List (NPL) in 1994.

Site Background and Characteristics

Site 1 – Incinerator Landfill

Site 1, the Incinerator Landfill, is located on the northeastern tip of Horse Island at MCRD Parris Island, as shown on Figure 1. The site is illustrated on Figure 2 and occupies approximately 7 acres and was formerly covered with mature pine trees. From 1921 to 1965, Site 1 served as the disposal site for combustion residues from the incinerator. Wastes were initially piled on the land or placed in trenches into an adjacent marsh, extending the edge of the landfill farther into the marsh. Fill dirt was also used to build up the land at the edge of the marsh. The landfill progressively extended farther into the marsh as wastes were dumped on the edge of the fill. The landfill currently extends approximately 670 feet toward Archers Creek and is approximately 400 feet in width.

The majority of wastes disposed in the landfill during this time were nonhazardous, combustible domestic wastes and other noncombustible wastes (e.g., cans, bottles, and construction debris). Additionally, hazardous wastes generated from the MCRD from 1921 to 1959 were reportedly treated in the incinerator and disposed in the landfill. Paint thinners (mineral spirits), diesel fuels, kerosene, and strippers (methylene chloride) were also reportedly poured onto the landfill and burned. No auxiliary fuels were used for open burning. Since 1965, no significant disposal or intrusive activity has taken place within the boundaries of Site 1.

Previous investigations at Site 1 include an Initial Assessment Study (IAS) in 1986, a Verification Step (VS) in 1988, an Interim RCRA Facility Assessment (RFA) in 1990, a combined RI/RFI in 1998–1999, and an FS/CMS in 2001.

SWMU 41 – Former Incinerator

SWMU 41, the Former Incinerator, consisted of a coal-fired brick chamber, that was approximately 43 feet long, 34 feet tall, and 20 feet wide. Emissions from the incinerator were vented through a hole in the top of the chamber. A ramp was situated along one of the unit's sides to provide access to the top of the incinerator. Trucks carried wastes up the ramp and discharged them into the hole. Incinerated wastes were subsequently disposed at Site 1. SWMU 41 remained in operation until 1959. Site 1 continued to be used for disposal of combustible trash and noncombustible waste until 1965.

Previous investigations at SWMU 41 include an Interim RFA in 1990, a combined RI/RFI in 1998-1999, and an FS/CMS in 2001.

Scope and Role of the Proposed Action

Approximately 46 sites at MCRD Parris Island are being investigated under the Installation Restoration (IR) Program. This Proposed Plan addresses Site 1 and SWMU 41; the remaining 44 sites will be addressed separately.

Based upon the risk assessments undertaken during the study of Site 1 and SWMU 41, the soils of Site 1 and SWMU 41 and sediment and surface water of Site 1 currently pose risk to human health and the environment. As a result, a remedial action is planned at Site 1 and SWMU 41 to reduce these risks. Waste and sediment containing chemicals in excess of cleanup goals for pesticides, PAHs, and inorganics will be excavated from the outside perimeter of the landfill and consolidated on site. A landfill cap will be constructed at Site 1 that will reduce human and ecological contact with waste and contaminated soil and sediment. Waste and contaminated soil and sediment will no longer be in direct contact with surface water, resulting in a reduced transport of contaminants to surface water.

The role of a Proposed Plan is to present the preferred alternative to the public. The Proposed Plan briefly summarizes the alternatives that were studied, highlighting the key factors that led to the selection of the preferred alternative.

A Closer Look at the Proposed Remedy

The following text explains in further detail the proposed remedy (Modified Alternative 2a). Modified Alternative 2a was developed by the Partnering Team after the first draft of the FS/CMS was issued. This alternative combines elements of Alternatives 2a and 2b. This alternative is also illustrated in Figure 3.

1. **Sediment and Waste Excavation**
   Contaminated sediment would be excavated and consolidated within the limits of a proposed landfill cap system. This sediment would consist of sediment containing concentrations of inorganic chemicals (copper, mercury, and lead), PAHs, and pesticides above the clean-up goals, or remedial goal options (RGOs), for protection of ecological receptors; however, this sediment would not include the arsenic concentrations in sediment northwest of the waste materials that were detected above RGOs. Under current and future land-use scenarios that exclude residential development in the saltwater marsh, the arsenic concentrations are within acceptable risk ranges. Likewise, the arsenic concentrations were not determined to pose a significant threat to ecological receptors. Waste material (e.g., glass, ash) located outside the limits of the proposed cap system would also be excavated and consolidated within the limits of the cap. Verification sampling would be performed prior to completion of the cap system to allow for additional excavation and consolidation, if required.

2. **Low-Permeability Cap System Installation**
   A low-permeability cap system that meets or exceeds the requirements of the federal and state solid waste and hazardous waste landfill closure requirements would be placed over approximately 6.3 acres of consolidated and graded waste and contaminated sediment materials. All excavated waste would be consolidated over the mean high tide level. Figure 4 shows a typical cross-section of this cap system.

3. **Slope Stabilization and Erosion Control**
   Slope stabilization and erosion control measures would be implemented along the toe and sideslopes of the landfill cap system to minimize the potential for failure of the sideslopes and to reduce the erosion rate of the cover due to surface water runoff, waves, and/or wind.

4. **Salt Marsh Restoration**
   Excavated areas would be restored by filling in the excavation area with sand and then vegetating the area with local common vegetation (e.g., cordgrass). The sediment in the area would be temporarily stabilized to minimize erosion and then monitored over time to ensure re-establishment.

5. **Land-use Controls and Long-term Monitoring**
   Land-use controls would be implemented to control or eliminate pathways of exposure to chemicals of concern (COCs) through the Land-Use Control Implementation Plan (LUCIP) and Land-Use Control Assurance Plan (LUCAP). Additionally, long-term monitoring of groundwater and sediment would be conducted and a re-evaluation of the site would be performed every 5 years to determine whether changes to the land-use controls, monitoring, and/or remedial action would be required. Routine operation and maintenance of the landfill cap system would also be performed.

Summary of Site Risks

In accordance with the U.S. EPA's Presumptive Remedy for CERCLA Municipal Landfill Sites and Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills (Interim Guidance), the Site 1 RI/RFI characterized media where the potential for off-site migration of contamination was suspected but did not characterize the landfill contents. Media that were

investigated during the RI/RFI consisted of surface soil and downgradient groundwater, surface water, and sediment. The human health risk evaluations for Site 1 and SWMU 41 were conducted in accordance with U.S. EPA presumptive landfill remedy directives. These directives provide that, where an established human health standard for a contaminant along a migration pathway is exceeded, there is a basis for selecting a presumptive remedy of containment.

During the RI/RFI, potential environmental risks associated with this site were evaluated for human health and ecological receptors in accordance with U.S. EPA guidelines. The risk assessments considered the current land use at Site 1 and SWMU 41, which is industrial, and a hypothetical unrestricted future land use. Site groundwater is not currently used as a potable water supply and is not expected to be used as a potable water supply due to its high salt content. The risk estimates were based on receptor (e.g., human, osprey, raccoon), duration of exposure (e.g., 1 day per week), pathway (e.g., ingestion of soil or groundwater), ingestion rates (pounds per day), and representative concentration of contaminants. The estimated risks were then compared to established criteria for evaluation.

Human Health Risk Assessment

Maximum detected concentrations at Site 1 and SWMU 41 were compared to risk-based and health-based screening criteria. If the maximum concentration exceeded any one of the screening criteria, that chemical was retained as a chemical of potential concern (COPC). COPCs identified for Site 1 and SWMU 41 are presented in Table 1. The risk assessment then evaluated potential exposure pathways including direct contact and ingestion of soil, groundwater, surface water, and sediment, inhalation of soil dust and groundwater vapors, and consumption of fish living within the site. Potential receptors consisted of construction workers, maintenance workers, recreational users, and potential future residents. Recreational users are individuals who fish or wade within the waters adjacent to Site 1.

Risk estimates developed in the human health risk assessment were divided into carcinogenic (cancer) and noncarcinogenic (noncancer) concerns. For carcinogenic risks, a range of 1 in 10,000 (1.0E-04) to 1 in 1,000,000 (1.0E-06) incremental lifetime cancer risk (ILCR) is considered to be acceptable by the U.S. EPA. For noncarcinogenic concerns, the U.S. EPA threshold value Hazard Index (HI) is 1.0.

As shown in Table 2, direct contact with surface water by the adolescent recreational user and hypothetical future resident were shown to result in estimated cancer risks that exceed U.S. EPA's acceptable range of 1.0E-04 to 1.0E-06. Bis(2-ethylhexyl) phthalate and pentachlorophenol are the main contributors for these risks.

Furthermore, potential health effects associated with recreational harvesting and consumption of fish tissue were estimated under several scenarios. Chemical concentrations in fish were estimated through theoretical equilibrium partitioning of surface water contamination to fish. This approach is expected to be very conservative for this site. Under site-specific conditions (weekly fish consumption over a 6-year period and use of average surface water concentrations), cancer risks are within the U.S. EPA acceptable risk range. Under more conservative assumptions (daily fish consumption over a 30-year period and/or use of maximum surface water concentrations), cancer risks are not considered to be acceptable by the U.S. EPA. Site chemicals contributing to these risks are pentachlorophenol and arsenic.

Under all fish consumption scenarios, HIs exceeded the acceptable limit of 1.0, indicating that noncarcinogenic effects are possible. Pentachlorophenol, dibenzofuran, arsenic, iron, and manganese were the main contributors to this noncarcinogenic risk.

Direct contact of surface soil by the construction worker and hypothetical child and adult future resident also resulted in HIs greater than 1.0. Antimony and iron were the main contributors to this noncarcinogenic risk.

Under other exposure scenarios, cancer and non-cancer risks were within acceptable ranges.

Ecological Risk Assessment

For ecological receptors, potential impacts were considered for benthic macroinvertebrates (e.g., aquatic worms), aquatic receptors (e.g., fish, heron, and osprey), and terrestrial receptors (e.g., shrew, robin). To evaluate the data, a range of screening criteria is available, from very conservative to site-specific conditions. The initial screening criteria are based on the U.S. EPA Region 4 ecological screening values for soil, sediment, and surface water. These values are considered to be protective of all species, including benthic macro invertebrates. These values are established at very low levels, and background concentrations (natural or anthropogenic) can be higher. Chemicals that are present at levels below these screening values do not normally require additional evaluation. Chemicals were detected above these screening values and indicate that risks may be present to lower-level ecological receptors (e.g., plants and worms) via direct contact and ingestion of site media or uptake of site chemicals by plants. Table 3 presents the results of this initial screening.

The next level of evaluation in the ecological risk assessment is a comparison of the data to no-observed-adverse-effects levels (NOAELs). The NOAELs represent dosages to higher level ecological receptors (e.g., shrew, heron, raccoon) for which adverse impacts are not normally anticipated. For each receptor, a Hazard Quotient (HQ) is calculated based on a receptor's intake of a chemical through consumption of contaminated food and sediment, surface water, and soil. An HQ of less than 1.0 indicates that adverse effects for that receptor would not be expected. The results of this evaluation are summarized on the following table and indicate that risks may be present to terrestrial (land-based) animals via direct contact with sediment, surface water, and soil and ingestion of soil, sediment, surface water, and prey. Additionally, risks may be present to aquatic (water-based) animals via direct contact with sediment and surface water and ingestion of sediment, surface water, and prey.

SUMMARY OF ECOLOGICAL RISKS
SITE 1 – INCINERATOR LANDFILL
SITE 41 –FORMER INCINERATOR
MCRD PARRIS ISLAND, SOUTH CAROLINA

Receptor	Risk Estimates	Exposure Route
Terrestrial and Aquatic Plants, Soil Invertebrates, Benthic Receptors	U.S. EPA Region 4 Screening Levels; HQs for surface water (max = 21.7), sediment (max = 260), surface soil (max = 1,760), and groundwater (max = 9.2)	Direct contact with sediment, prey, surface water, and soil; ingestion of sediment, prey, surface water, soil, and food; and uptake by plants
Aquatic Food Chain Receptors – Maximum Concentrations - Raccoon - Heron - Mummichog - Red Drum - Osprey	Food-Chain Modeling, Maximum HQs: 2,601 83.5 4.9 1.7 50.4	Direct contact with sediment and surface water; ingestion of sediment, prey, and surface water
Terrestrial Food Chain Receptors – Maximum Concentrations - Shrew - Robin - Hawk - Mouse - Fox - Woodcock	Food Chain Modeling, Maximum HQs: 352 1,102 172 816 172 1,959	Direct contact with sediment, surface water, and soil; ingestion of sediment, prey, surface water, soil, and food

NA – NOAELs not available.

Site Risk Summary

The human health and ecological risk assessments conclude that risks exist from human and ecological contact with site soil, sediment, and surface water. Consequently, it is the U.S. Navy's current judgment that the preferred alternative identified in this Proposed Plan, or one of the other active measures considered in this Proposed Plan, is necessary to protect public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment or from actual or threatened releases of pollutants or contaminants from this site which may present an imminent and substantial endangerment to public health or welfare.

Use of Applicable or Relevant and Appropriate Requirements in Evaluation Process

Applicable or Relevant and Appropriate Requirements (ARARs) are federal and state environmental requirements used to evaluate the appropriate extent of site cleanup, to scope and formulate remedial alternatives, and to control the implementation and operation of a selected remedial action. Potential chemical-, location-, and action-specific ARARs are defined in the FS/CMS for Site 1 and SWMU 41 dated January 2002. Each alternative was evaluated to chemical-, location-, and action-specific ARARs that apply to Site 1 and SWMU 41 and are presented in Section 3.0 of the FS/CMS.

What are the Clean-Up Objectives and Levels?

Using the information gathered during the investigations and the results of the baseline risk assessment, the following remedial action objectives (RAOs) were established:

- Eliminate contact with landfill contents and impacted surface soils by human and ecological receptors.
- Eliminate the migration of COCs from the source material (impacted soil, waste, and fill) to downgradient media (i.e., sediment, surface water, and groundwater).
- Eliminate human exposure (i.e., direct exposure to maintenance worker, future construction worker, future recreational users, and hypothetical future resident) to COCs in sediment at concentrations in excess of RGOs. RGOs take into consideration an ILCR of 1.0E-06 for individual COCs. Additionally, RGOs take into consideration an HQ of 1.0 where noncarcinogenic effects would be expected. Elimination of COCs in sediment will also address human health concerns identified from chemicals detected in surface water.
- Eliminate exposure of ecological receptors to COCs in sediment at concentrations greater than RGOs. The sediment RGOs take into account direct contact of COCs by macroinvertebrates and are protective of upper food-chain receptors. RGOs address risks where only minor effects may be anticipated by ecological receptors and consider site background concentrations.
- Comply with chemical-specific, location-specific, and action-specific federal and state ARARs.

The soil and sediment COCs that exceed RGOs are provided in Table 4.

Clean-Up Alternatives for Site 1 and SWMU 41

The FS/CMS Report presents the options that the U.S. Navy considered for cleanup of Site 1 and SWMU 41. The clean-up options, referred to as Remedial Alternatives, are different combinations of plans to restrict access and to contain, remove, or treat contamination in order to protect public health and the environment.

During the upcoming public comment period, the MCRD Parris Island welcomes your comments on the proposed clean-up plan and on the other technical approaches that were evaluated. These clean-up alternatives are summarized below. Please consult the FS/CMS Report for more detailed information.

Based on information currently available, it is the Navy's opinion that the preferred alternative, Modified Alternative 2a, provides the best balance among the other alternatives, with respect to the evaluation criteria.

Clean-Up Alternatives

No Action

Alternative 1 – No Action: Evaluation of the no-action alternative is required by law as a basis for comparison with other alternatives. No remedial action would be taken to eliminate risks to human health and the environment. Concentrations of contaminants may eventually be reduced to clean-up levels through natural attenuation processes but no monitoring would be performed to quantify this reduction. As existing soil erosion continues, contaminant levels may actually increase in surrounding surface water and sediment. Mechanisms would not be in place to determine whether the alternative would comply with ARARs or achieve RAOs.

Containment

Each of the containment alternatives (Alternatives 2a and 2b) include the following:

- Excavation of waste outside the limits of a proposed landfill cap.
- Consolidation of excavated material within the proposed cap system.
- Installation of a low-permeability cap system over the consolidated and regraded waste.
- Installation of slope stabilization and erosion control measures.
- Restoration and monitoring of the salt marsh area where excavation was performed.

- Operation and maintenance of the landfill cap system.
- Land-use controls and long-term monitoring.
- Five-year reviews of the site.

The alternatives differ in the volume of contaminated sediment that would be excavated and the type of long-term monitoring that would be conducted. The containment alternatives serve to protect humans and ecological species from exposure to contaminated soils and waste materials.

Alternative 2a would address sediment contaminated with inorganics (copper, mercury, and lead) and pesticides through excavation/consolidation and address sediment contaminated with PAHs through monitored natural recovery. Modified Alternative 2a would addressed sediments contaminated with inorganics (copper, mercury, and lead), pesticides, and PAHs through excavation/consolidation. Neither Alternative 2a or Modified Alternative 2a would include excavation of arsenic concentrations in sediment northwest of the waste material; however, the arsenic concentrations are within acceptable human heath risk ranges under current and future land-use scenarios and do not represent a significant threat to ecological receptors. Alternative 2b would address all contaminated sediment through excavation/consolidation.

Land-use controls will be implemented for the purposes of (a) restricting human contact with waste materials and site media contaminated with organic and inorganic constituents, (b) restricting soil disturbance activities, and (c) prohibiting residential development of the site. Specifically, site restrictions would be enacted to prohibit unauthorized intrusive activity within the landfill and to ban the use of groundwater as a drinking water supply. Signs would be posted to alert users of the property about the presence of the landfill.

Land uses that do not conflict with these restrictions (e.g., recreational, industrial or commercial) would be permitted. Implementation of the proposed plan at Site 1 and SWMU 41 would not restrict such development; however, because waste would be left on site, unrestricted reuse of this site would not be allowed. If future land use at Site 1 and SWMU 41 is inconsistent with the land-use controls, then the site exposure scenarios for human health and the environment would be re-evaluated to assess whether the response action remains appropriate. The land-use controls will be documented in the LUCIP contained in the ROD for Site 1 and SWMU 41. Additionally, the LUCIP will be included in the LUCAP agreement signed by the Navy, U.S. EPA, and SCDHEC.

The land-use controls will be stated in full or by reference within deeds, easements, mortgages, leases, or other instruments of property transfer. These land-use controls will be drafted, implemented and enforced in cooperation with federal, state, and local government and will be maintained as long as contaminants remained at concentrations above protective clean-up levels. The LUCIP will detail the land-use controls to be incorporated/referenced within instruments of property transfer and ensure that the land-use control requirements are met. The ROD will state that the LUCIP includes a checklist of elements to be assessed during regularly scheduled on-site inspections and interviews with the site property owner, manager, or designees.

Removal/Disposal

Alternative 3 would protect on-site humans and ecological species from exposure to all waste material and contaminated soil and sediment. All waste material and contaminated soil and sediment would be excavated from the site and transported to approved off-site disposal facilities. Afterwards, the salt marsh area where excavation was performed would be restored.

What impacts would the remedial action have on the local community?

- Alternatives 1, 2a, Modified 2a, 2b, and 3 would not pose environmentally significant short-term effects to the neighboring off-base community.

- Under Alternative 3, there would be short-term impacts to traffic conditions because of the 6,000 truck loads of waste material that would be transported off site under this alternative. The time required to complete remedial actions under these alternatives is anticipated to be within 1 year. Health and safety training and proper personal protective equipment (PPE) usage would minimize any effects to site workers during implementation of these alternatives.

Next Steps

By May 15, 2002, the Partnering Team expects to have reviewed all public comments and issued a Record of Decision (ROD). The ROD will address all public comments and will include a summary of comment responses. The ROD will then be made available to the public in the information repository at the Beaufort County Public Library Headquarters. The MCRD will also announce the Navy's decision through the local news media and the community mailing list. Please use the attached form to be included on the community mailing list.

Comparison of Clean-Up Alternatives

In the FS/CMS, each alternative was evaluated against several criteria. Threshold criteria (protection of human health and the environment and compliance with ARARs) are requirements that each alternative must meet in order to be eligible for selection. Primary balancing criteria (long-term effectiveness, reduction of toxicity, mobility or volume through treatment, short-term effectiveness, implementability, and cost) are used to weigh major trade-offs among alternatives. Modifying criteria (state acceptance and community acceptance) are of equal importance to the balancing criteria during the final balancing of trade-offs between alternatives. This section presents a summary comparison of the alternatives to these criteria.

Protection of Human Health and the Environment

- Alternative 3 would provide the most overall protection compared to Alternatives 1, 2a, Modified 2a, and 2b. The complete removal of all sediment, sediment/waste, and waste from the site and its disposal at an appropriate off-site facility would be effective and permanent.

- Alternatives 2a, Modified 2a, and 2b are equal to one another with respect to the long-term protection of human health and the environment. All of the of containment options rely on the placement of the most contaminated sediment within a capped landfill and constructing and maintaining the integrity of the cap system and long-term O&M. Through banning unauthorized intrusive activity, land-use controls would protect human health by preventing human exposure to waste material contained within the landfill. Additionally, the land-use controls would protect human health by restricting human access to contaminated sediment left to attenuate through monitored natural recovery and by preventing human ingestion of groundwater.

- Alternative 2a is somewhat less protective in the short-term than Modified Alternative 2a and Alternative 2b because PAHs in sediment (representing a potential threat to macroinvertebrates and humans) would remain at the site. Also, both Alternatives 2a and Modified 2a leave low levels of arsenic (representing a potential threat to humans) in the site sediment. Under Alternative 2a, natural attenuation factors, such as biodegradation and dispersion, may require approximately 10 to 30 years to achieve RGOs.

- Alternative 1 is not protective of human health and the environment. In addition, site risks may increase as waste material continues to erode.

Compliance with ARARs

- Alternative 1 would not comply with ARARs.

- Alternatives 2a, Modified 2a, and 2b would attain all chemical-specific ARARs in the long term. With Alternatives 2a, Modified 2a, and 2b, containment would reduce the release of the landfill contents into the groundwater and surrounding sediment and surface water. Alternatives 2a and Modified 2a include partial sediment removal, and Alternative 2b removes all impacted sediment. Alternative 2a relies on monitored natural recovery for the reduction of PAHs within sediment and land-use controls for arsenic within sediment. Therefore, Alternative 2b and Modified 2a would attain the chemical-specific ARARs for organic COCs in a shorter and more assured manner than Alternative 2a.

- Alternative 3 would attain all chemical-specific ARARs.

- Alternatives 1, 2a, Modified 2a, 2b, and 3 would attain all location-specific ARARs; however, the extent to which coastal wetlands would be restored to beneficial use differs under these alternatives.

- Alternatives 2a, Modified 2a, 2b, and 3 would attain all action-specific ARARs. Action-specific ARARs are not applicable to Alternative 1.

Long-Term Effectiveness

- No controls would be in place to determine whether Alternative 1 would be reliable and effective in the long term.

- Alternatives 2a, Modified 2a, and 2b would be equally effective in the long term. Under Alternative 2a, potential residual risks would result from human and ecological exposure to sediment containing PAHs; however, monitored natural recovery would reduce the concentrations of these PAHs over the long term (approximately 10 to 30 years). Alternatives 2a, Modified 2a, and 2b rely on the long-term effectiveness of the cap system. Land-use controls would be effective in preventing human exposure to remaining contaminants in sediment by preventing residential development. Also, land-use controls would effectively prevent human ingestion of groundwater and human

contact with waste contained within the landfill. The remaining COCs in sediment either do not represent significant threat to ecological receptors (e.g., arsenic) or will degrade naturally over time (e.g., PAHs). Approximately 1.5, 1.8, and 3.1 acres of wetlands would be created or restored under Alternatives 2a, Modified 2a, or 2b, respectively.

- Alternative 3 provides the most effective long-term remediation option. All impacted sediment, sediment/waste, and waste would be removed from the site. The complete removal would eliminate monitoring and related long-term issues. Approximately 11.4 acres of wetlands would be created or restored under Alternative 3.

Reduction in the Toxicity, Mobility, or Volume through Treatment

- Alternatives 1, Modified 2a, 2b, and 3 would not include treatment technologies. Alternative 2a would include the use of monitored natural recovery for the reduction of PAHs in sediments. These alternatives would not reduce the toxicity or volume of the waste material or sediment COCs other than that which would result from natural dispersion, dilution, or other attenuating factors. Approximately 58,100, 59,000, and 62,100 cubic yards of landfill material and sediment would be contained within the cap systems in Alternatives 2a, Modified 2a, and 2b, respectively. Alternative 3 does not involve any on-site treatment (although an off site disposal facility may opt to treat this material prior to disposal). Under Alternative 3, approximately 68,100 cubic yards of waste material and sediment would be excavated and disposed at an appropriate off-site facility.

Short-Term Effectiveness

- Alternatives 1, 2a, Modified 2a, 2b, and 3 would not pose environmentally significant short-term effects to the neighboring off-base community. Under Alternative 3, there would be short-term impacts to traffic conditions because of the 6,000 truck loads of waste material that would be transported off site under this alternative.

- Under Alternatives 2a, Modified 2a, 2b, and 3, 2 to 5 acres of wetlands in the vicinity of landfill would be affected but then returned to natural conditions. Additionally, aquatic receptors that inhabit the area of impacted sediment would be subject to short-term effects resulting from excavation or covering; however, these areas would be expected to re-establish to natural conditions after implementation.

- The RAOs would be achieved in approximately 1 year under Alternatives Modified 2a, 2b, and 3. RAOs may take approximately 10 to 30 years to be achieved under Alternative 2a.

- Health and safety training and proper personal protection equipment usage would minimize any effects to site workers during implementation of these alternatives.

Implementability

- The implementation of Alternatives 2a, Modified 2a, 2b, and 3 is technically and administratively feasible. MCRD Parris Island is an active military installation; therefore, land-use controls at Site 1 and SWMU 41 are easily implementable and enforceable. This evaluation criterion is not applicable to Alternative 1.

Cost

- The costs of the alternatives (including land-use controls) are shown in the following table.

State Acceptance

- South Carolina concurs with this proposed remedy.

Alternative	Capital ($)	Operating ($/year)	30-Year Present Worth ($)
1	0	0	0
2a	6,166,000	23,000 to 70,000	6,513,000
Modified 2a	6,453,000	21,000 to 70,000	6,775,000
2b	7,069,000	21,000 to 70,000	7,391,000
3(1)	14,737,000	0	14,737,000
3(2)	13,422,000	0	13,422,000

1 Assumes 10 percent of the landfill's contents are hazardous.
2 Assumes 1 percent of the landfill's contents are hazardous.

Community

- Community acceptance will be determined based on comments received during the public comment period.

Why Does the U.S. Navy Recommend the Preferred Alternative?

It is the Navy's judgment that the preferred alternative (Modified Alternative 2a) is necessary to protect public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment. Based on the information currently available, the Navy believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Navy believes that the preferred alternative satisfies the statutory requirements in CERCLA Section 121(b), which states that the selected alternative be protective of human health and the environment, comply with ARARs, be cost effective, utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and satisfy the statutory preference for treatment as a principle element.

Specifically, the preferred alternative would be protective of human health and the environment because:

- human and ecological contact with waste and contaminated soil would be eliminated through consolidation of this material under the landfill cap,
- the migration of COCs contained in media consolidated under the cap would be eliminated.
- human exposure to COCs in sediment would be eliminated via either consolidation of media under the cap or implementation of land-use controls,
- exposure of ecological receptors to sediment with concentrations of pesticides, PAHs, and inorganics above RGOs would be eliminated via the consolidation of this material under the landfill cap.

U.S. EPA and SCDHEC (as support agencies) concur with the preferred alternative.

Community Participation

What's a Formal Comment?

Formal comments are used to improve the Proposed Plan. To make a formal comment, you need to present your views during the public meeting or submit a written comment during the 60-day comment period. The public meeting will be held on February 19, 2002 at the Technical College of the Low Country, 921 Ribaut Road, Beaufort, South Carolina 29902 starting at 6:30 P.M. Written comments should be sent to

Commanding General
Marine Corps Recruit Depot
Attn: Timothy J. Harrington, NREAO
P.O. Box 19003
Parris Island, SC 29905-9003
Tel: 843-228-3423

E-mail comments by April 2, 2002 to

email: harringtontj@mcrdpi.usmc.mil

The MCRD Parris Island and Navy will review the transcript of all comments received at the public meeting and all written comments received during the formal comment period before making a final decision. They will then prepare a written response to all comments. The transcript of comments and the MCRD Parris Island and Navy's written responses will then be issued in a document called the Community Responsiveness Summary, which is part of the ROD.

For More Detailed Information

To help the public understand and comment on the proposal for the site, this document summarizes a number of reports and studies. The technical and public information publications prepared to date for Site 1 and SWMU 41 are available at the following information repository:

Beaufort County Public Library Headquarters
311 Scott Street
Beaufort, South Carolina 29902

TABLE 1

CHEMICALS RETAINED AS HUMAN HEALTH COPCs
SITE 1 - INCINERATOR LANDFILL AND SWMU 41 - FORMER INCINERATOR
MCRD PARRIS ISLAND, SOUTH CAROLINA

Chemical	Surface Soil	Groundwater	Surface Water	Sediment	Soil to Air	Soil to Groundwater	Fish
Volatile Organics							
Chloroform		X					
Semivolatile Organics							
Benzo(a)anthracene				X			
Benzo(a)pyrene	X			X			
Benzo(b)fluoranthene				X			
Bis(2-ethylhexyl)phthalate			X				X
Chrysene			X				
Dibenzo(a,h)anthracene				X			
Dibenzofuran		X	X				X
Indeno(1,2,3-cd)pyrene				X			
Naphthalene		X					
Pentachlorophenol			X				X
Phenanthrene		X					
Pesticides/PCBs							
4,4'-DDE	X						
4,4'-DDT	X						
alpha-BHC						X	
beta-BHC						X	
gamma-BHC (Lindane)						X	
Inorganics							
Aluminum	X	X	X				X
Antimony	X					X	
Arsenic	X	X	X	X			X
Barium		X					
Cadmium	X						
Chromium						X	
Iron	X	X	X	X			X
Lead	X	X	X				X
Manganese	X	X	X	X			X
Mercury			X				
Thallium				X			
Vanadium		X	X				

Notes
X - Indicates chemical was retained as a COPC.

TABLE 2

SUMMARY OF CANCER RISKS AND HAZARD INDICES
SITE 1 - INCINERATOR LANDFILL, SWMU 41 - FORMER INCINERATOR
MCRD PARRIS ISLAND, SOUTH CAROLINA

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks >10^{-4}	Chemicals with Cancer Risks >10^{-5}	Chemicals with Cancer Risks >10^{-6}	Hazard Index	Chemicals with HI > 1
Construction Worker	Soil	Ingestion	7.6E-07	--	--	--	**1.9**	Iron
		Dermal Contact	3.7E-07	--	--	--	0.2	--
		Total	1.1E-06	--	--	--	**2.1**	Iron
	Groundwater	Dermal Contact	2.4E-09	--	--	--	0.06	--
	Sediment	Ingestion	2.3E-07	--	--	--	0.05	--
		Dermal Contact	3E-07	--	--	--	0.005	--
		Total	5.3E-07	--	--	--	0.05	--
	Surface Water	Ingestion	6.5E-08	--	--	--	0.009	--
		Dermal Contact	3.8E-06	--	--	BEHP, Pentachlorophenol	0.009	--
		Total	3.9E-06	--	--	BEHP, Pentachlorophenol	0.02	--
		Total All Media	4.8E-06				**2.2**	
Maintenance Worker	Soil	Ingestion	1.6E-06	--	--	Arsenic	0.2	--
		Dermal Contact	1.5E-06	--	--	--	0.04	--
		Total	3E-06	--	--	Arsenic	0.2	--
	Sediment	Ingestion	1.4E-06	--	--	--	0.01	--
		Dermal Contact	3.6E-06	--	--	cPAHs	0.002	--
		Total	5E-06	--	--	cPAHs	0.01	--
		Total All Media	8.1E-06				0.2	
Adolescent Recreational Users	Soil	Ingestion	8.8E-07	--	--	--	0.2	--
		Dermal Contact	7.7E-07	--	--	--	0.05	--
		Total	1.7E-06	--	--	Arsenic	0.3	--
	Sediment	Ingestion	1.6E-06	--	--	cPAHs	0.03	--
		Dermal Contact	3.8E-06	--	--	cPAHs	0.006	--
		Total	5.4E-06	--	--	cPAHs	0.04	--
	Surface Water	Ingestion	3.5E-07	--	--	--	0.009	--
		Dermal Contact	**1.1E-04**	--	BEHP, Pentachlorophenol	--	0.009	--
		Total	**1.1E-04**	--	BEHP, Pentachlorophenol	--	0.02	--
		Total All Media	**1.2E-04**				0.3	
Adult Recreational Users	Soil	Ingestion	3.4E-07	--	--	--	0.1	--
		Dermal Contact	4.4E-07	--	--	--	0.05	--
		Total	7.8E-07	--	--	--	0.2	--
	Sediment	Ingestion	6.1E-07	--	--	--	0.02	--
		Dermal Contact	2.2E-06	--	--	cPAHs	0.006	--
		Total	2.8E-06	--	--	cPAHs	0.03	--
	Surface Water	Ingestion	1.4E-07	--	--	--	0.006	--
		Dermal Contact	6.3E-05	--	BEHP, Pentachlorophenol	--	0.006	--
		Total	6.4E-05	--	BEHP, Pentachlorophenol	--	0.01	--
		Total All Media	6.7E-05				0.2	
	Fish (Maximum concentration in surface water)	Conservative	**2.0E-03**	Pentachlorophenol, Arsenic	BEHP	--	**23.8**	Dibenzofuran, Pentachlorophenol, Arsenic, Iron, Manganese
		Site-Specific	**1.4E-04**	Pentachlorophenol	Arsenic	BEHP	**8.2**	Iron
	Fish (Average concentration in surface water)	Conservative	**6.0E-04**	Pentachlorophenol	Arsenic	BEHP	**6.5**	Iron
		Site-Specific	4.1E-05	--	Pentachlorophenol	Arsenic	**2.2**	Iron
Child Resident	Soil	Ingestion	2.5E-05	--	Arsenic	cPAHs, 4,4'-DDT	**10.1**	Antimony, Iron
		Dermal Contact	5.6E-06	--	--	cPAHs, Arsenic	0.6	--
		Total	3.0E-05	--	Arsenic	cPAHs, 4,4'-DDT	**10.7**	Antimony, Iron
	Sediment	Ingestion	5.7E-06	--	--	cPAHs, Arsenic	0.2	--
		Dermal Contact	3.1E-06	--	--	cPAHs	0.008	--
		Total	8.8E-06	--	--	cPAHs, Arsenic	0.2	--
	Surface Water	Ingestion	6.4E-07	--	--	--	0.03	--
		Dermal Contact	**1.0E-04**	--	BEHP, Pentachlorophenol	--	0.03	--
		Total	**1.0E-04**	--	BEHP, Pentachlorophenol	--	0.06	--
		Total All Media	**1.4E-04**				**11.0**	
Adult Resident	Soil	Ingestion	1.1E-05	--	--	cPAHs, Arsenic	**1.1**	--
		Dermal Contact	4.8E-06	--	--	Arsenic	0.1	--
		Total	1.5E-05	--	Arsenic	cPAHs	**1.2**	--
	Sediment	Ingestion	2.5E-06	--	--	cPAHs	0.02	--
		Dermal Contact	3.0E-06	--	--	cPAHs	0.002	--
		Total	5.5E-06	--	--	cPAHs	0.02	--
	Surface Water	Ingestion	5.5E-07	--	--	--	0.006	--
		Dermal Contact	**2.5E-04**	Pentachlorophenol	BEHP	--	0.006	--
		Total	**2.5E-04**	Pentachlorophenol	BEHP	--	0.01	--
		Total All Media	**2.8E-04**				**1.3**	
Lifelong Resident	Soil	Ingestion	3.5E-05	--	Arsenic	cPAHs, 4,4'-DDE, 4,4'-DDT	NA	--
		Dermal Contact	1.0E-05	--	--	Arsenic	NA	--
		Total	4.6E-05	--	Arsenic	cPAHs, 4,4'-DDE, 4,4'-DDT	NA	--
	Sediment	Ingestion	8.2E-06	--	--	cPAHs, Arsenic	NA	
		Dermal Contact	6.1E-06	--	--	cPAHs	NA	
		Total	1.4E-05	--	cPAHs	Arsenic	NA	--
	Surface Water	Ingestion	1.2E-06	--	--	--	NA	--
		Dermal Contact	**3.6E-04**	BEHP, Pentachlorophenol	--	--	NA	--
		Total	**3.6E-04**	BEHP, Pentachlorophenol	--	--	NA	--
		Total All Media	**4.2E-04**				NA	

Note: Shading indicates an exceedance of the U.S. EPA target risk range (1.0E-04 to 1.0E-06) for cancer risks or the acceptable limit of 1.0 for hazard indices.
BEHP = Bis(2-ethylhexyl)phthalate

TABLE 3

CHEMICALS RETAINED AS ECOLOGICAL COPCS
SITE 1 - INCINERATOR LANDFILL AND SWMU 41 - FORMER INCINERATOR
MCRD PARRIS ISLAND, SOUTH CAROLINA

Analyte	Surface Water	Sediment	Surface Soil Site 1	Surface Soil Site 41	Groundwater
Volatile Organics					
2-Butane					X
Acetone	X	X		X	X
Carbon Disulfide		X			X
Toluene		X			
Xylenes, Total					X
Semivolatile Organics					
1,2,4-Trichlorobenzene			X		
2,4-Dimethylphel					X
2-Methylnaphthalene	X		X		X
2-Methylphel					X
Acenaphthylene		X			
Anthracene		X			
Benz(a)anthracene		X	X		
Benzo(a)pyrene		X	X		
Benzo(b)fluoranthene		X	X		
Benzo(g,h,i)perylene		X	X		
Benzo(k)fluoranthene		X	X		
Bis(2-ethylhexyl) phthalate	X		X		X
Butylbenzyl phthalate			X		
Carbazole		X	X		X
Chrysene	X	X	X		
Dibenzo(a,h)anthracene		X			
Dibenzofuran	X		X		X
Di-n-octyl phthalate			X		X
Fluoranthene		X	X	X	
Fluorene		X			
Inde(1,2,3-cd)pyrene		X	X		
Naphthalene					X
Pentachlorophel	X				
Phenanthrene		X	X	X	
Pyrene		X	X	X	X
Total PAHs		X			
Pesticides/PCBs					
4,4'-DDD		X	X	X	
4,4'-DDE		X	X		
4,4'-DDT		X	X	X	
Alpha-Chlordane		X	X		
Aroclor 1260			X		
Endrin Ketone			X		
Gamma-Chlordane		X	X		
alpha-BHC		X	X		
beta-BHC		X	X		
delta-BHC		X	X		
gamma-BHC (Lindane)		X	X		
Inorganics					
Aluminum	X	X	X	X	X
Antimony	X		X		
Arsenic		X	X		
Barium	X	X	X		X
Beryllium		X			X
Cadmium		X	X		
Chromium			X	X	
Cobalt	X	X			
Copper	X	X	X	X	X
Iron	X	X	X	X	X
Lead	X	X	X	X	X
Manganese	X	X	X		X
Mercury	X	X	X	X	X
Nickel			X		
Selenium				X	
Silver	X	X	X		
Thallium		X			
Vanadium	X	X	X	X	X
Zinc	X	X	X	X	X

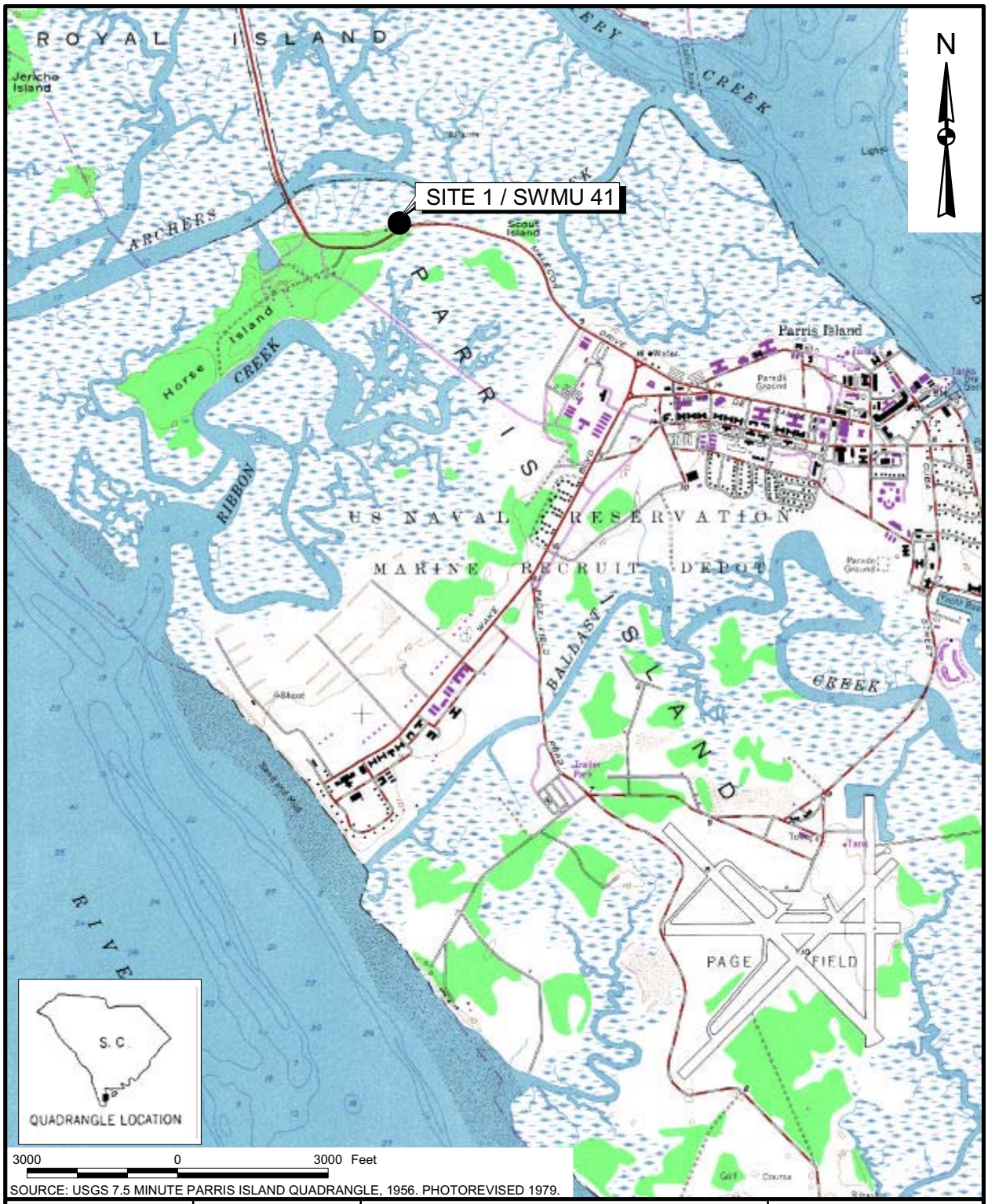
TABLE 4

SELECTION OF SURFACE SOIL AND SEDIMENT RGOs
FOR THE PROTECTION OF HUMAN AND ECOLOGICAL RECEPTORS
SITE 1 - INCINERATOR LANDFILL AND SWMU 41 - FORMER INCINERATOR
MCRD PARRIS ISLAND, SOUTH CAROLINA

Sediment COCs	Maximum Concentration	Background/ Typical Facility Concentration [1]	Region 9 Residential Soil PRG [2]	Selected Human Health Sediment RGO	Region 4 ESV [3]	Selected Ecological RGO
PAHs (ug/kg)						
B(a)P Equivalents [4]	3821	NA	434[9]	434[9]	NA	NA
Total PAHs [5]	29455	NR	NA	NR	1684	1684
PESTICIDES (ug/kg)						
4,4'-DDD	260	33.6	2400	NR	3.3	33.6 [1]
4,4'-DDE	120	31.6	1700	NR	3.3	31.6 [1]
4,4'-DDT	270	34.5	1700	NR	3.3	34.5 [1]
DDTR [6]	650	99.8	5800	NR	9.9	99.8
Alpha Chlordane	52	13.9	1600 [10]	NR	1.7 [10]	13.9
Gamma Chlordane	130	13.2	1600 [10]	NR	1.7 [10]	13.2
INORGANICs (mg/kg)						
Arsenic	18.8	12	0.39	12.4 [8]	7.24	NR
Copper	95.3	10	2900	NR	18.7	18.7
Lead	238	21	400 [7]	NR	30.2	30.2
Mercury	0.67	0.09	23	NR	0.13	0.13
Surface Soil COCs						
PAHs (ug/kg)						
B(a)P Equivalents [4]	854	NA	434[9]	434[9]	NA	NA
Total PAHs [5]	7464	NA	NA	NA	1000	1000
PESTICIDES/PCBs (ug/kg)						
Alpha-BHC	42	NA	90	NR	2.5	2.5
Beta-BHC	33	NA	320	NR	1	1
Gamma-BHC (Lindane)	75	NA	440	NR	0.05	0.05
4,4'-DDD	180	33.6	2400	1700	2.5	33.6 [1]
4,4'-DDE	4200	31.6	1700	NR	2.5	31.6 [1]
4,4'-DDT	4400	34.5	1700	1700	2.5	34.5 [1]
DDTR [6]	8780	99.8	5800	5800	9.9	99.8
Aroclor-1260	80	NA	220	NR	20	20
INORGANICs (mg/kg)						
Aluminum	8610	7270	76000	NR	50	7270 [1]
Antimony	90.6	ND	31	31	3.5	3.5
Arsenic	24.9	1.44	0.39	1.83 [8]	10	10
Barium	178	24	5400	NR	165	165
Cadmium	5.4	ND	37	NR	1.6	1.6
Chromium	53.2	6.2	210	NR	0.4	6.2 [1]
Copper	131	1.5	2900	NR	40	40
Iron	147000	3920	23000	26920 [8]	200	3920 [1]
Lead	8380	12.5	400	412.5 [8]	50	50
Manganese	752	129	1,800	NR	100	129 [1]
Mercury	1.1	0.11	23	NR	0.1	0.110 [1]
Nickel	47.8	1.8	1600	NR	30	30
Selenium	1.1	0.29	390	NR	0.81	0.81
Silver	2.4	ND	390	NR	2	2
Vanadium	47.4	9.5	550	NR	2	9.5 [1]
Zinc	497	9.7	23000	NR	50	50

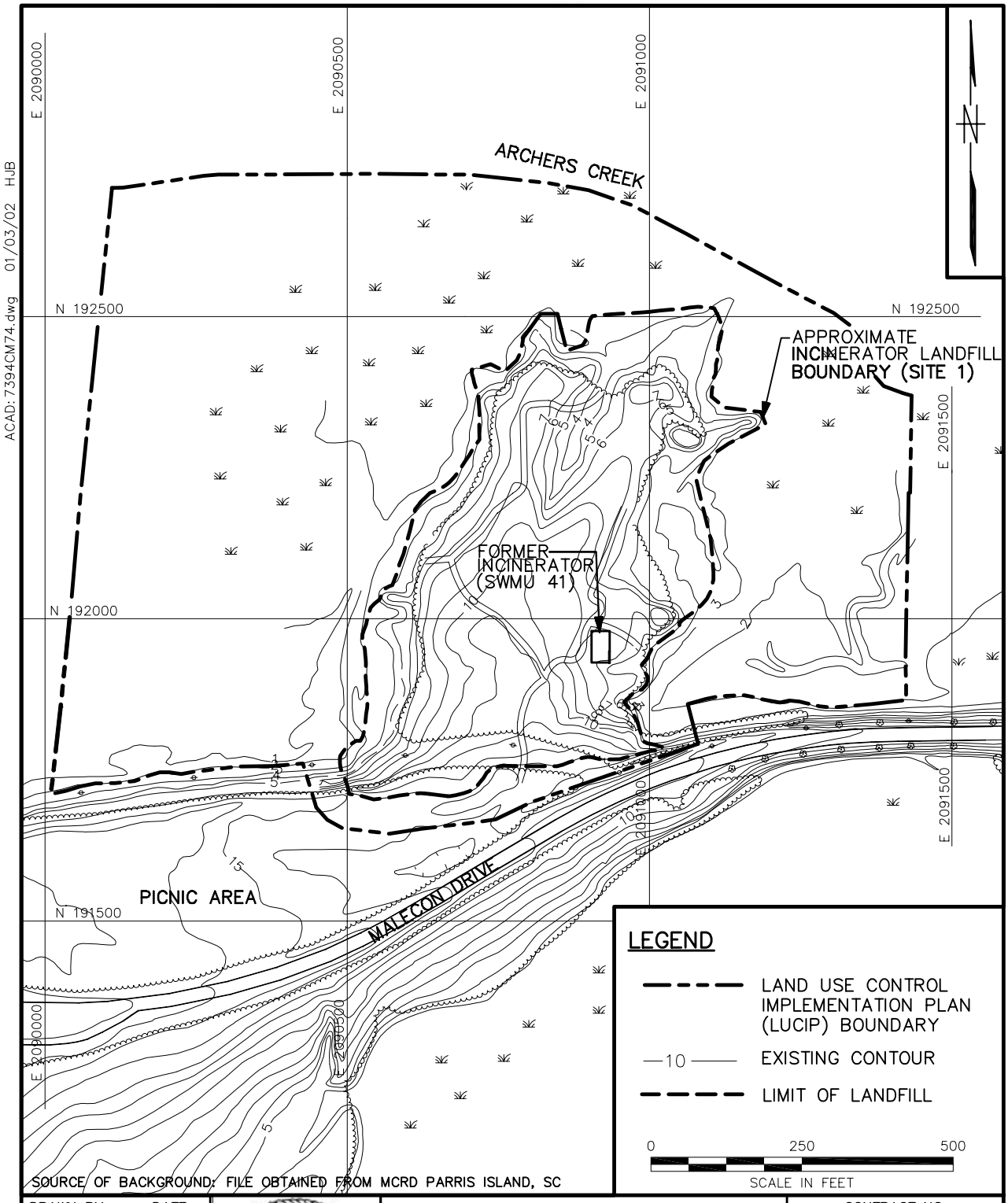
(1) Background/typical facility sediment concentrations taken from Site 1 RI/RFI (TtNUS, 2000). Pesticide values are typical facility concentrations.
(2) U.S. EPA Region 9 PRG Residential Soil Table (U.S. EPA, 2000)
(3) U.S. EPA Region 4 Ecological Screening Values (U.S. EPA, 1998)
(4) BAP equivalents = benzo(a)anthracene(0.1) + benzo(a)pyrene(1.0) + benzo(b)fluoranthene(0.1) + benzo(k)fluoranthene(0.01) + chyrsene(0.001) + dibenzo(a,h)anthracene(1.0) + indeno(1,2,3-cd)pyrene (0.1)
(5) Total PAHs = Low Molecular Weight PAHs + High Molecular Weight PAHs
* Low Molecular Weight = 2-methylnaphthalene + acenaphthene + acenaphthylene + anthracene + fluorene + naphthalene + phenanthrene
* High Molecular Weight PAHs = benzo(a)anthracene + benzo(a)pyrene + chyrsene + dibenzo(a,h)anthracene + fluoranthene + pyrene
* One-half of the detection limit is used for nondetected PAHs to calculate Total PAHs and BAP Equivalents.
(6) DDTR = DDD + DDE + DDT.
(7) OSWER Soil Screening Level for Residential Landuse (U.S. EPA, 1994).
(8) RGO is PRG + Background per U.S. EPA guidance.
(9) Calculated as 7 x benzo(a)pyrene Region 9 PRG.
(10) Based on total chlordane.

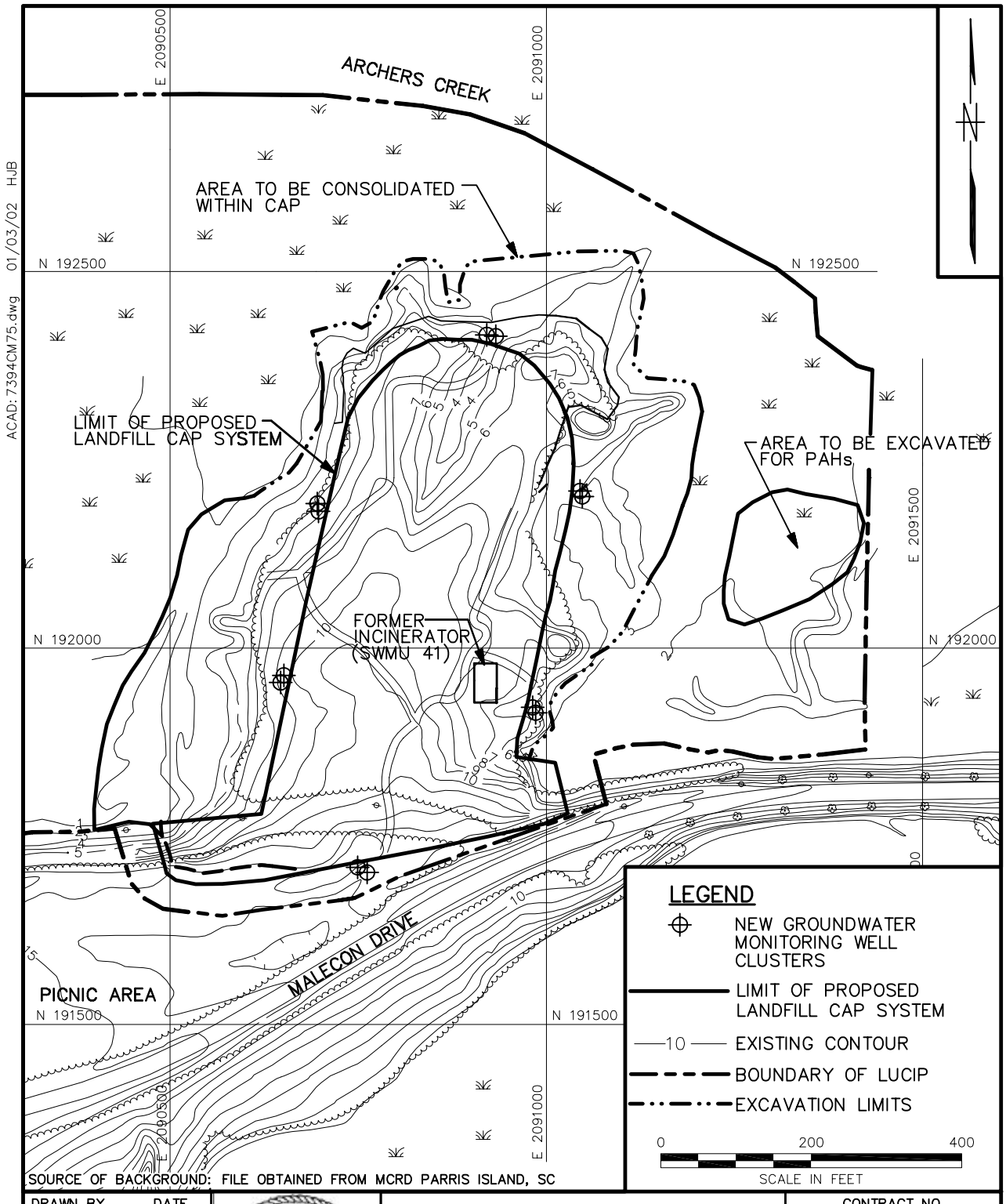
ND = Nondetect
NA = Not Available
NR = Not Relevant. Maximum Concentration is Below RGO



DRAWN BY MJJ	DATE 09Oct99		CONTRACT NUMBER 7803
CHECKED BY	DATE	DEPOT LOCATION MAP MCRD, PARRIS ISLAND, SOUTH CAROLINA	APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1-1 / REV 0

P:\GIS\MCRD_ParrisIsland\parris.apr 09Oct99 MJJ Depot Location Map

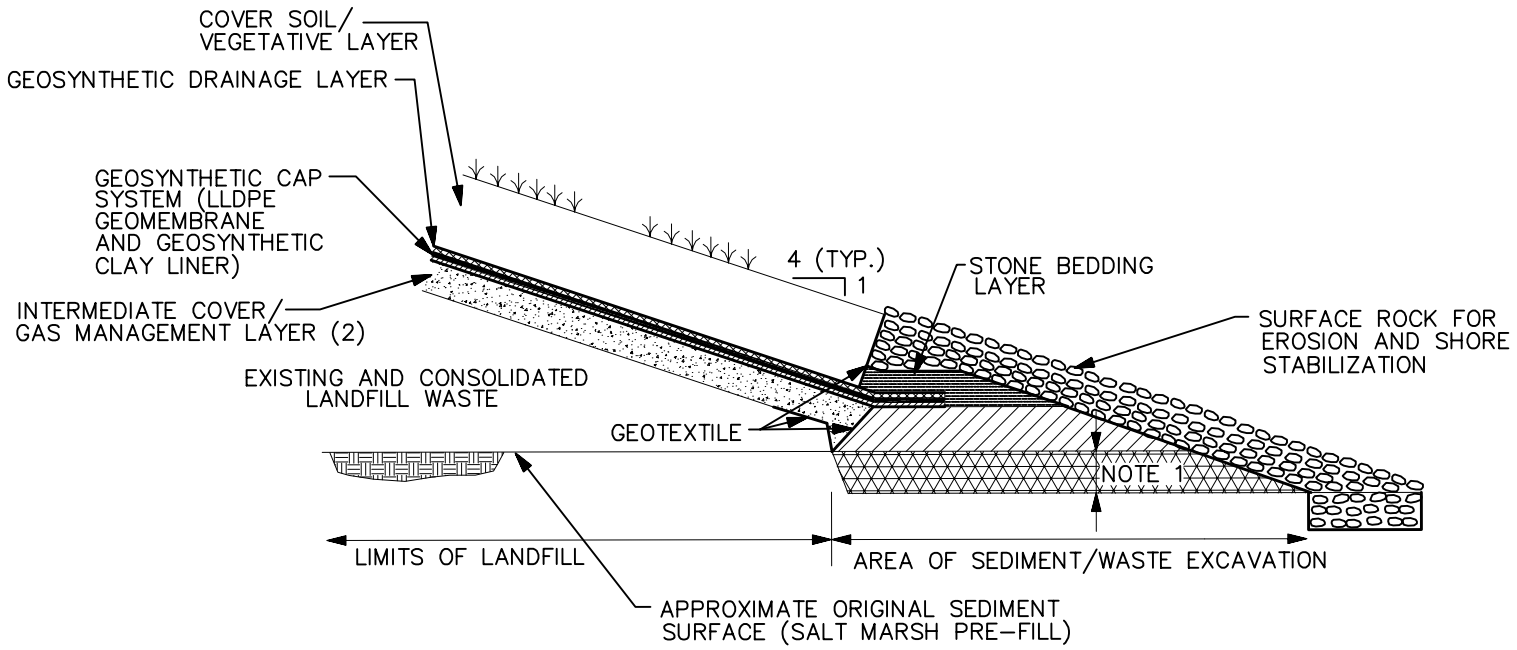

ACAD: 7394CM74.dwg 01/03/02 HJB
E 2090000
E 2090500
E 2091000
E 2091500
N 192500
N 192000
N 191500
ARCHERS CREEK
APPROXIMATE INCINERATOR LANDFILL BOUNDARY (SITE 1)
FORMER INCINERATOR (SWMU 41)
PICNIC AREA
MALECON DRIVE
LEGEND
LAND USE CONTROL IMPLEMENTATION PLAN (LUCIP) BOUNDARY
10 EXISTING CONTOUR
LIMIT OF LANDFILL
0 250 500
SCALE IN FEET
SOURCE OF BACKGROUND: FILE OBTAINED FROM MCRD PARRIS ISLAND, SC
DRAWN BY DATE
HJP 6/21/01
CHECKED BY DATE
COST/SCHED-AREA
SCALE
AS NOTED
SITE BOUNDARY
SITE 1 – INCINERATOR LANDFILL AND
SWMU 41 – FORMER INCINERATOR
MCRD PARRIS ISLAND, SOUTH CAROLINA
CONTRACT NO.
7394
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO.
FIGURE 2
REV.
0
FORM CADD NO. SDIV_AV.DWG – REV 0 – 1/20/98



DRAWN BY DATE HJP 6/21/01		PROPOSED REMEDY SITE 1 – INCINERATOR LANDFILL AND SWMU 41 – FORMER INCINERATOR MCRD PARRIS ISLAND, SOUTH CAROLINA	CONTRACT NO. 7394
CHECKED BY DATE			APPROVED BY DATE
COST/SCHED–AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3 / REV. 0

FORM CADD NO. SDIV_AV.DWG – REV 0 – 1/20/98

ACAD: 7394CD10.dwg 01/03/02 HJB



NOTES:

1. THIS SUBSURFACE AREA INCLUDES STRUCTURAL FILL WHERE SEDIMENT/WASTE EXCAVATION IS PERFORMED WITHIN LIMITS OF CAP SYSTEM
2. METHANE GENERATION WILL BE MEASURED AND A METHANE VENTING SYSTEM MAY BE NECESSARY BASED ON THE RESULTS OF THE METHANE GENERATION STUDY.

DRAWN BY HJP DATE 6/21/01		TYPICAL CAP SYSTEM SECTION MODIFIED ALTERNATIVE 2A SITE 1 – INCINERATOR LANDFILL AND SWMU 41 – FORMER INCINERATOR MCRD PARRIS ISLAND, SOUTH CAROLINA	CONTRACT NO. 7394
CHECKED BY DATE			APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 4 REV. 0

FORM CADD NO. SDIV_AH.DWG - REV 0 - 1/20/98

ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMS	Corrective Measures Study
COPC	Chemical of Potential Concern
FS	Feasibility Study
HI	Hazard Index
HQ	Hazard Quotient
IAS	Initial Assessment Study
ILCR	Incremental Lifetime Cancer Risk
IR	Installation Restoration
LUCAP	Land Use Control Assurance Plan
LUCIP	Land Use Control Implementation Plan
MCL	Maximum Contaminant Level
MCRD	Marine Corps Recruit Depot
Navy	Department of the Navy
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NOAEL	No-Observed-Adverse-Effect Level
NPL	National Priorities List
O&M	Operation And Maintenance
OSWER	Office of Solid Waste and Emergency Response
PAHs	Polynuclear Aromatic Hydrocarbons
PRG	Preliminary Remediation Goal
RAOs	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RFA	RCRA Facilities Assessment
RFI	RCRA Facilities Investigation
RGO	Remedial Goal Options
RI	Remedial Investigation
SCDHEC	South Carolina Department of Health and Environmental Control
SWMU	Solid Waste Management Unit
U.S. EPA	United States Environmental Protection Agency
VS	Verification Step

Marine Corps Recruit Depot, Parris Island
Site 1 and SWMU 41
Public Comment Sheet

Use this space to write your comments or to be included on the mailing list:

The MCRD Parris Island and the Navy want your written comments on the option under consideration for Site 1 and SWMU 41. You can use the form below to send written comments. If you have questions about how to comment, please call Tim Harrington at (843) 228-3423. This form is provided for your convenience. Please mail this form or additional sheets of written comments, postmarked no later than April 2, 2002, to

Commanding General
Marine Corps Recruit Depot
Attn: Timothy J. Harrington, NREAO
P.O. Box 19003
Parris Island, SC 29905-9003

Tel: 843-228-3423

E-mail comments by April 2, 2002 to
email: harringtontj@mcrdpi.usmc.mil

(Attach sheets as needed)

Comment submitted by: _____

Mailing list additions, deletions, or changes

If you did not receive this through the mail or would like to

- ☐ be added to the site mailing list
- ☐ note a change of address
- ☐ be deleted from the mailing list
- ☐ obtain additional information concerning the Restoration Advisory Board

Name: _____
Address: _____
_____
_____

please check the appropriate box and fill in the correct address information above.

Marine Corps Recruit Depot, Parris Island
Site 1 and SWMU 41
Public Comment Sheet (continued)

Fold, staple, stamp, and mail ----------

Place
Stamp
Here

Commanding General

Marine Corps Recruit Depot

Attn: Timothy J. Harrington, NREAO

P.O. Box 19003

Parris Island, SC 29905-9003